
Confirmation Bias In The Diagnostic Process

The Capricorn astrology symbol dates from December 22nd to January 19th. It is said that Capricorns are born leaders. They are controlling, disciplined, good managers, responsible, loyal, and honest. Capricorns can also be bossy, unforgiving, cold, materialistic, and snobbish. It is easy to spot a Capricorn because they are the one who is most likely to be early to work and the last to leave. They are the one who will take control of the situation and lead.

There are people who truly believe in the astrology signs and let it influence every aspect of their life. When they meet someone, they instantly know everything about that person based on their date of birth. All a person's characteristics dwindle down to one label that is given to them at birth. Capricorn, Cancer, Scorpio, Gemini, and many others are different constellations that make the zodiac. If someone is energetic, caring, and devoted, they must be an Aries. Every caring deed just proves that they are an Aries, even when that person is being self-centered and jealous. It all just confirms that person's belief in the zodiac. This type of belief is also known as a confirmation bias: the idea that any new information a person learns only confirms their prior beliefs. It is not limited to believing in the zodiac, but it can be anything. Political confirmation bias leads people who have strong beliefs in a certain political party that all facts that they receive will either support their belief that their party is right or disproves the opposing party. In the medical field, confirmation bias may impact patients' diagnosis and treatments. When a doctor has a confirmation bias, he or she may see all the symptoms of a patient and assume one diagnosis based on the doctor's prior beliefs on a certain disorder or disease. This leads to the question "what are the implications of confirmation bias that impacts the diagnoses of patients?". There are many studies that can connect to this question. Research has developed topics on confirmation bias in a general aspect, confirmation bias in diagnosis, diagnosis processes, and how to reduce confirmation bias. This research can help benefit the medical field in ways that not only helps the way doctors think but in the treatment and health of patients.

Firstly, confirmation bias impacts everyone on a daily basis. Confirmation bias is defined as discrepancies or the tendency to interpret or seek out new evidence as confirmation of one's prior beliefs or theory while ignoring or minimalizing counter evidence. People who put their trust and belief in astrology have a confirmation bias that skews their perception of people, events, and life that confirms the description of the zodiac symbols. In politics, people may search for information that either adds value to campaign or discredits the opposing party. Any information found that would discredit their campaign is either ignored, minimalized, or discredited as an invalid source. Confirmation bias is also seen in the school system when teachers have beliefs or opinions on students before they meet them and assumes anything the student does confirms that opinion. Students also have the same confirmation bias about teachers or subjects. While most of these examples seem negative, confirmation bias does have a positive aspect. People develop confirmation bias usually through knowledge that they gain throughout their life. The zodiac descriptions give people sense and reasoning of others' behaviors and personalities with an over generalization. Politicians use confirmation bias to keep voters voting for them. It also can help student-teacher relationships by giving teachers sense of understanding of students that will enter their class, as long as it is not fixated but flexible.

In a study by Powell, Hughes-Scholes, and Sharman (2012), police officers were given background information about children. This information is what established a confirmation bias in the police officers' interviewing process. Children participated in series of activities then seven days later they were interviewed about that day by the police officers. Based on the authors' analysis, interviews who asked more open-ended questions showed less bias than those who chose more particular information that may have been given in the background information that the officer received prior to the interview. Doctors may use confirmation bias to help diagnose patients with symptoms that they are familiar with or specialize in. Some doctors have a specialization such as cardiologists. Patients go to a cardiologist when they have heart problems. These doctors may have confirmation bias towards heart disease. When patients arrange an appointment with a cardiologist, the doctor may assume their symptoms are related to heart disease while discarding other minor symptoms that are unrelated. While this may work for specialized doctors, it can also hinder patients' health when symptoms are misdiagnosed. Doctors Moreno and Johnston (2013) conducted a study of the impact of confirmation bias on the treatment of diverse patients. Moreno and Johnston (2013) found confirmation bias when doctors are unfamiliar with a diverse individual or when they were on a time restraint and unable to do follow-up treatments with the patient. Confirmation bias can help if a person is trying to get specific information that person has prior knowledge on, but can block other information not specific to the task or that could counter it. It has its positive and negative aspects depending on the task at hand and affects everyone in different ways that most do not realize.

When a patient is being diagnosed by a medical professional, they are in all intents and purposes being examined and having the nature of their illnesses being identified as a certain disease, disorder, or malfunction. There are different processes that people in the medical field use to diagnose someone. Izydorczyk and Gaska (2015) were trying to establish a criteria for patients with multiple symptoms of differing mental disorders for outpatient therapy. They conducted research with selected participants from the Neurosis Treatment Centre and in the Mental Health Clinic. Izydorczyk and Gaska (2015) interviewed patients using a structured psychodynamic approach and the Rorschach Inkblot Test. They found eight significant criteria to qualify patients with personality disorders for outpatient therapy (2015). It would seem logical for all medical professionals to use the same criteria for examining and diagnosing patients, it is not always the case. While there are certain medical manuals that doctors may refer to when diagnosing a patient, some medical professionals may also use a form of clinical judgement/reasoning based on their knowledge and experience. In the psychological field, psychologists have the Diagnostic and Statistical Manual of Mental Disorders. The DSM is created by a group of psychological professionals in the American Psychological Association.

The American Psychological Association updates the DSM every few years to incorporate and edit the manual with the latest information. Dr. Morey and Benson (2016) hypothesized that when clinicians adhere to the specific criteria in the DSM the reliability of assigning the correct diagnosis increases. After obtaining demographical and background information on 444 clinicians and their intended patient, that may have a psychological disorder, through an online survey, Morey and Benson presented the diagnostic information from the DSM-IV-TR and DSM-IV, then created a checklist of the material for the clinicians to mark present or not that pertained to their current patient (2016). Their results showed that clinical diagnosis often differ some to the DSM diagnostic criteria. This is not the only study that tested the use of official diagnostic criteria. When faced with learning disabilities (LDs), Schroeder, Drefs, and Cormier (2017) hypothesized that with faced with a lack of a coherent approach or definition of a LD, clinical reasoning will more likely be elevated. They investigated the agreement between clinical

diagnostic decisions and strict diagnostic models using 313 LD cases from two clinics. The results of Schroeder, Drefs, and Cormier's study showed that 88% of their cases were positively identified as a learning disability when the clinician used one or more of the models. However, their data suggested that clinicians were not adhering to one model and were considering confidence intervals with reading learning disabilities. When clinicians are not agreeing or adhering to the criteria, this leaves an open question of "why?". One study made the attempt to answer the question of why clinicians are not agreeing or adhering to the diagnosing criteria. Goodyear-Smith, van Driel, Arroll, and Del Mar (2012) noticed that two groups of medical professionals were at opposing ends of the usage of meta-analyses to increase the effectiveness of screening for depression in patients and theorized that confirmation bias may be the culprit for the disagreement of the two groups. After objectives, findings, and conclusions were assessed from both groups, Goodyear-Smith and associates (2012) compared and analyzed data between the two groups and their motives. With results more complex than the authors had anticipated, discrepancies were found, but it does lead to a bigger question of how confirmation bias impacts the diagnoses in patients.

While there are different processes to a final diagnosis, there are also different factors that may impact it. One of the factors is a confirmation bias. In the medical field, a confirmation bias is when someone's prior belief in something medical related impacts their diagnosis or belief in a diagnosis or treatment. The role of confirmation bias used in the diagnostic process is a common factor so much that there have been several studies to detect its impact. Since confirmation bias is based on someone's prior belief of a topic, the conclusion can be considered a knowledgeable assumption based on someone's knowledge and experience. Michael Allen (2011) of Brunel University, hypothesized that it is impossible to collect data with zero expectations of the outcome and remain truly neutral or unbiased throughout the whole process. Allen (2011) selected 9-13-year-old students to participate in his study where he taught them 50 lessons followed by a questionnaire and interview. He used the lessons and questionnaire as his independent variable and the dependent variable was the students' behavior. The results supported Allen's (2011) hypothesis as it led to a theory led confirmation bias as students leaned towards their preferred hypothesis during lessons. Authors Bar-Tal, Brycz, Dolinska, and Dolinski (2017) decided to study the accuracy of confirmation bias. Using 340 undergraduate students from Gdansk University, Bar-Tal and associates divided them randomly into two groups: "self" or "other". The purpose of these two labels was to manipulate the students to think of either themselves or others. The "other" group was asked to judge the patience of another person in a series of scaled questions. The "self" group were to do the same but with questions regarding themselves. Their results found a "significant correlation between metacognitive self and confirmation bias".

The study by Moreno and Johnston (2013) studied the impact of confirmation bias, and their findings were misdiagnoses due to possible confirmation bias or critical errors in judgement. They stated that confirmation bias led to these misdiagnoses due to being unfamiliar with their patients' culture, ethnicity, and time restraints in examining and treating them. Since the physician was unfamiliar with their patients, they were forced to rely on prior knowledge and beliefs that they knew to interpret their patients' symptoms into something they already knew and recommend treatment based on that decision. This process led to several misdiagnoses (. Since confirmation bias affects patients, Hergovich, Schott, and Burger (2010) returned to the foundation of knowledge and investigated academia. Hergovich and colleagues (2010) recreated older, similar studies that examined the confirmation bias of the psychologists that evaluate the studies used to further the process of education. The study found implications that

psychologists today have a similar bias as previous studies on the same topic: that no matter the degree of education confirmation bias was found, and the rate of disconfirmation of a non-established theory are favored over established theories. Armed with the knowledge that confirmation bias can create a misdiagnosis and can cause a doctor to ignore other symptoms that are important, it leads to the question of: “why do doctors continue to stick to their prior belief if they could be wrong?” Mendal and associates (2011), searched for an answer to “Why psychiatrists stick to wrong preliminary diagnoses?”.

Mendel et al. (2011) hypothesized that confirmation bias was the cause of psychiatrists continuing to remain with wrong preliminary diagnoses. After 150 participants of psychiatrists and students were selected, Mendal et al. gave their participants a case to give a preliminary diagnosis then further final diagnosis and treatment after further examination of the patient (2011). The results discovered that the psychiatrists requested more disconfirmatory than confirmatory information while the students did a balanced search between the two, and that over half of the participants changed their initial diagnosis. Confirmation bias was established in some psychiatrists’ and students’ search and that led to inadequate diagnostic accuracy.

Over all, this study supports the hypothesis that confirmation bias leads to wrong diagnoses. These studies found evidence to support the conclusion that confirmation bias plays an impacting role in diagnoses that could lead to misdiagnosis and treatment.